

## **REMARKS**

### **I. Introduction**

Claims 9 to 21 and 26 are pending in the above-captioned application. In view of the following remarks, it is respectfully submitted that all of the presently pending claims are allowable, and reconsideration is respectfully requested.

### **II. Rejection of Claims 9, 11 to 15, 17 to 21 and 26 Under 35 U.S.C. § 103(a)**

Claims 9, 11 to 15, 17 to 21 and 26 were rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of allegedly admitted prior art ("AAPA") and U.S. Patent No. 4,321,010 ("Wilkinson et al."), U.S. Patent No. 4,589,478 ("Wunder") or U.S. Patent No. 5,600,950 ("Ottenschlaeger"), as well as U.S. Patent No. 5,299,619 (Chandley et al.). It is respectfully submitted that the combination of the AAPA and Wilkinson et al., Wunder or Ottenschlaeger, and Chandley et al. does not render unpatentable the present claims for at least the following reasons.

Claim 9 relates to a process for producing one of (a) half-tubes and (b) a tube of a metallic, high-temperature-resistant material with a plurality of openings passing through a surface of the one of (a) the half-tubes and (b) the tube for fabricating heat-exchanger tubes for a recuperative waste gas heat exchanger, including: forming a model, destroyable by heat, of each of the one of (a) the half-tubes and (b) the tube; forming a mold shell by finishing with a conventional gate system and immersion of the model in a ceramic coating composition and sanding with a cast shell ceramic material, alternating in several cycles; melting-out of the model from the mold shell; hardening the mold shell by firing; producing a melt from the metallic, high-temperature-resistant material; casting the melt in the mold shell one of (a) by applying a vacuum and (b) under excess pressure of an inert gas; removing, after solidification of the melt, the one of (a) the half-tubes and (b) the tube from the mold by destroying the mold shell; cleaning and trimming the one of (a) the half-tubes and (b) the tube and removing a sprue; and post-treating, as necessary, the openings passing through the surface of the one of (a) the half-tubes and (b) the tube by one of (a) spark erosion and (b) blasting with an abrasive blasting agent.

The alleged motivation set forth in the Final Office Action for combining the AAPA and the above-mentioned references, i.e., to simplify the heat exchanger making process, is not found in the AAPA or the references, but only in the Applicant's disclosure not included in the AAPA. Wilkinson et al., Wunder and Ottenschlaeger do mention investment casting and the formation of parts with

surface openings via investment casting, but none of these references provides a suggestion as to why investment casting would be simpler than forging for producing their respective devices. In addition, the AAPA cited by the Final Office Action does mention some problems of manufacturing heat exchanger tubes using forging and electrodischarge machining or electrochemical machining, but does not provide a suggestion as to why precision casting would be a simpler manner of manufacturing these heat exchanger tubes. In contrast, advantages of precision casting are mentioned on page 4 of the present Specification. Accordingly, it is respectfully submitted that the motivation of the Office Action for combining the AAPA and the above-mentioned references is invalid.

Notwithstanding the above, neither Wilkinson et al., nor Wunder, nor Ottenschlaeger, nor Chandley et al. disclose or suggest the feature of, e.g., forming a mold shell by finishing with a conventional gate system and immersion of the model in a ceramic coating composition and sanding with a cast shell ceramic material, alternating in several cycles. **In column 5, lines 30 to 35, Wilkinson et al. do describe investing a wax pattern with ceramic material to produce a mold and then melting out the wax and replacing it with molten metal to form a desired blade shape for an aerofoil member of a gas turbine engine. However, these steps of Wilkinson et al. are not repeated several times, nor is the ceramic sanded during the process.**

In addition, neither Wilkinson et al., nor Wunder, nor Ottenschlaeger, nor Chandley et al., nor the AAPA disclose or suggest the feature of post-treating, as necessary, the openings passing through the surface of the one of (a) the half-tubes and (b) the tube by one of (a) spark erosion and (b) blasting with an abrasive blasting agent. **On page 2, lines 30 to 31 of the Specification, the AAPA does describe electrodischarge machining (EDM) as a conventional method for producing openings in metals, but not as a conventional method for post-EDM treatment of the openings. To remove recast layers created by EDM, the AAPA merely states that a slow fine processing stage is necessary (see page 3, lines 10 to 14).** Accordingly, it is respectfully submitted that the combination of the AAPA and Wilkinson et al., Wunder or Ottenschlaeger, and Chandley et al. does not render unpatentable claim 9 for at least these reasons.

Claim 26 is an independent method claim analogous to claim 9. Accordingly, it is respectfully submitted that the combination of the AAPA and Wilkinson et al., Wunder or Ottenschlaeger, and Chandley et al. does not render

unpatentable claim 26 for at least the reasons set forth above in support of the patentability of claim 9.

As for claims 11 to 15 and 17 to 21, which ultimately depend from claim 9 and therefore include all of the features of claim 9, it is respectfully submitted that the combination of the AAPA and Wilkinson et al., Wunder or Ottenschlaeger, and Chandley et al. does not render unpatentable these dependent claims for at least the reasons set forth above.

As for claims 18 to 21, it is respectfully submitted that these claims are allowable for the following additional reasons.

As for claim 18, neither Wilkinson et al., nor Wunder, nor Ottenschlaeger, nor Chandley et al., nor the AAPA disclose or suggest a high-temperature-resistant material including IN 625.

As for claim 19, neither Wilkinson et al., nor Wunder, nor Ottenschlaeger, nor Chandley et al., nor the AAPA disclose or suggest producing half-tubes or tubes having elliptical openings.

As for claims 20 to 21, neither Wilkinson et al., nor Wunder, nor Ottenschlaeger, nor Chandley et al., nor the AAPA disclose or suggest producing half-tubes or tubes having lengths or radii described in these claims.

Accordingly, it is respectfully submitted that claims 18 to 21 are allowable for these additional reasons.

In view of all of the foregoing, withdrawal of this rejection is respectfully requested.

### **III. Rejection of Claim 10 Under 35 U.S.C. § 103(a)**

Claim 10 was rejected under U.S.C. § 103(a) as unpatentable over the combination of Wilkinson et al., Wunder, or Ottenschlaeger, and Chandley et al. and U.S. Patent No. 4,223,716 ("Ostrowski"). It is respectfully submitted that the combination of Wilkinson et al., Wunder, or Ottenschlaeger, and Chandley et al. and Ostrowski does not render unpatentable claim 10 for at least the following reasons.

Claim 10 depends from claim 9 and therefore includes all of the features of claim 9. As mentioned above, the combination of Wilkinson et al., Wunder, or Ottenschlaeger, and Chandley et al. does not disclose or suggest all of the features of claim 9. In addition, Ostrowski is not relied upon for disclosing or suggesting the features of claim 9 not disclosed or suggested by the combination of Wilkinson et al., Wunder, or Ottenschlaeger, and Chandley et al. Accordingly, it is

respectfully submitted that the combination of Wilkinson et al., Wunder, or Ottenschlaeger, and Chandley et al. and Ostrowski does not render unpatentable claim 10 for at least these reasons.

In view of all of the foregoing, withdrawal of this rejection is respectfully requested.

#### **IV. Rejection of Claim 16 Under 35 U.S.C. § 103(a)**

Claim 16 was rejected under U.S.C. § 103(a) as unpatentable over the combination of Wilkinson et al., Wunder, or Ottenschlaeger, and Chandley et al. and U.S. Patent No. 3,895,672 ("King, Jr. et al."). It is respectfully submitted that the combination of Wilkinson et al., Wunder, or Ottenschlaeger, and Chandley et al. and King, Jr. et al. does not render unpatentable claim 16 for at least the following reasons.

Claim 16 depends from claim 9 and therefore includes all of the features of claim 9. As mentioned above, the combination of Wilkinson et al., Wunder, or Ottenschlaeger, and Chandley et al. does not disclose or suggest all of the features of claim 9. In addition, King, Jr. is not relied upon for disclosing or suggesting the features of claim 9 not disclosed or suggested by the combination of Wilkinson et al., Wunder, or Ottenschlaeger, and Chandley et al. Accordingly, it is respectfully submitted that the combination of Wilkinson et al., Wunder, or Ottenschlaeger, and Chandley et al. and King, Jr. et al. does not render unpatentable claim 16 for at least these reasons.

In view of all of the foregoing, withdrawal of this rejection is respectfully requested.

**V. Conclusion**

In view of the foregoing, it is respectfully submitted that the presently pending claims are allowable. All issues raised by the Examiner having been addressed, an early and favorable action on the merits is respectfully requested.

Respectfully submitted,

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